



Department
of Energy &
Climate Change

The UK's CCS Programme: Domestic and International

21 October 2014

Matthew Billson
Office of CCS, DECC



CCS: Strategic importance



Security of supply

Fossil fuels generate around **60%** of UK electricity



Affordability

Without CCS climate targets £30bn more expensive per year by 2050

Climate change

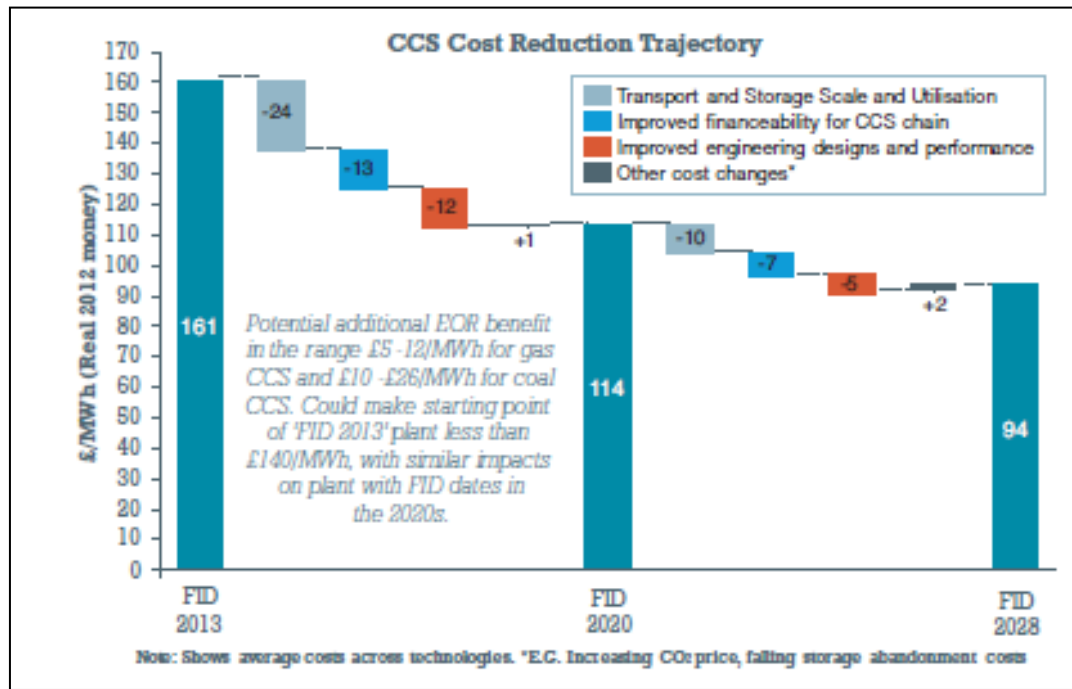
Target of an **80%** reduction in emissions by 2050



Jobs and growth

Low carbon economy; decarbonising energy intensive industries





UK CCS Cost Reduction Task Force (2013)

- Costs will come down – greatest cost reduction not from technology costs
- BUT need first commercial-scale full chain projects - quickest, best way to reduce costs
- Technology proven
- BUT need projects to test commercial, legal, regulatory framework



UK CCS policy: learning from previous experiences

First CCS Competition Lessons Learnt

"This competition was launched in 2007 with insufficient planning and recognition of the commercial risks and cancelled four years later. With commercial scale carbon capture and storage technology still to be developed, DECC must learn from the failure of this project"



Key Findings:
Initially insufficient resource and experience to deliver such a project
High risk undertaking. Evolving background of economic, policy and regulatory uncertainty
Failure to engage with commercial risks
Established finance for project 3 years after launch
Narrow project specifications limited bidders and options

Positives
Valuable learning experience for future competitions, findings shared with industry
Technical development and knowledge sharing from FEED – e.g. ROAD / Maasvlakte

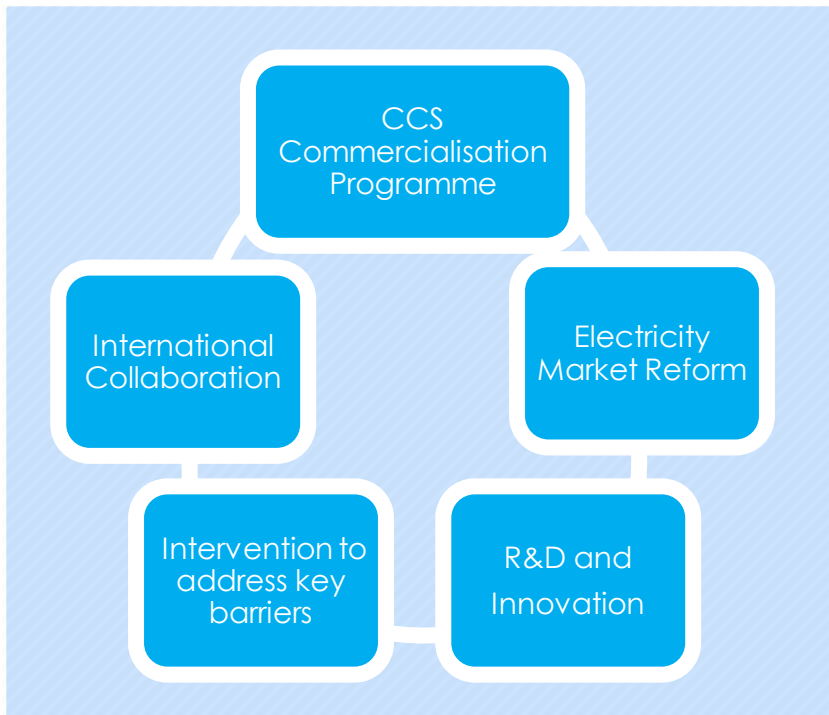


Need:

- Government commitment
- Financial support for:
 - Design study
 - Construction
 - Operation
 - Risk sharing

CCS Programme to date

Published CCS Roadmap in April 2012

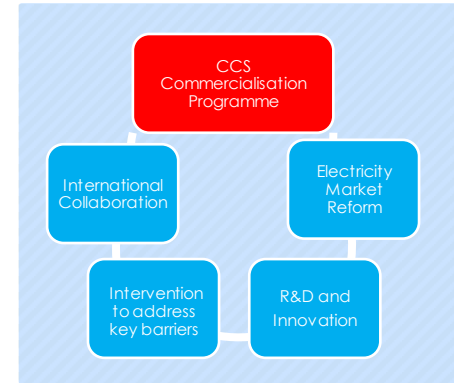


- £1bn CCS Commercialisation Programme
- Reforming electricity market to incentivise low carbon electricity
- £125m, 4 year, cross-Government R&D programme
- Addressing regulatory barriers
- International engagement to share knowledge and experience



Commercialisation programme

- **£1bn** of capital funding with additional operational support available through Contracts for Difference.
- **£100m** awarded to 2 FEEDS: White Rose and Peterhead
- Final Investment Decisions around the end of 2015



White Rose

- World's largest oxyfuel power plant
- New 340MW supercritical coal-fired plant in Yorkshire
- 90% capture; 2Mtpa of CO₂
- Offshore storage in saline aquifer

ALSTOM

Drax

nationalgrid

BOC
A Member of The Linde Group



Peterhead

- World's first gas-CCS power plant
- 340MW post-combustion retro-fit to a CCGT plant in Scotland
- 85% capture; 1Mtpa of CO₂
- Offshore storage in depleted gas field

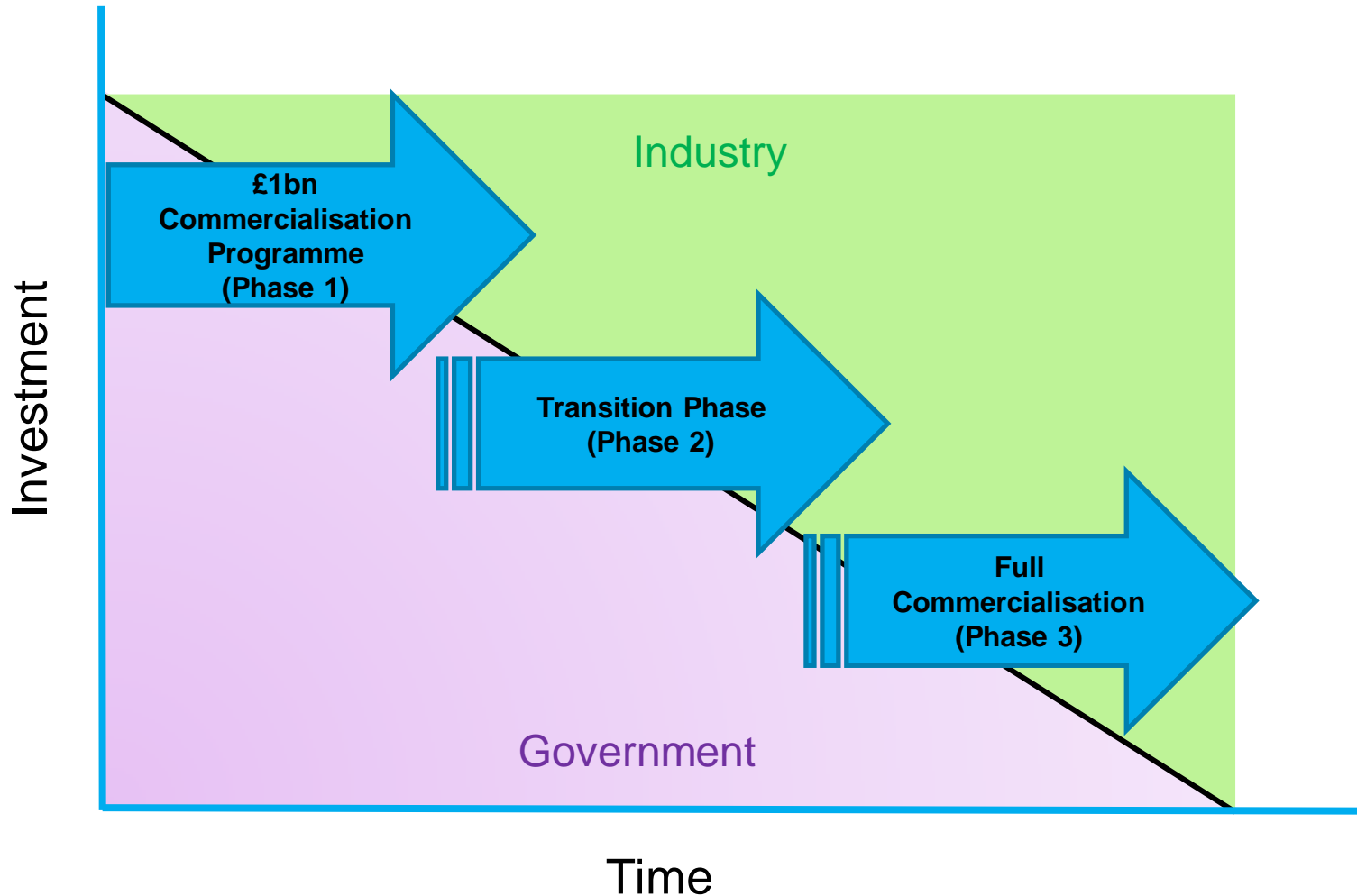


SSE





Path to full commercialisation





Path to full commercialisation

High-level principles for government intervention to support CCS: reducing levels of support through phases to full commercialisation

Government contribution to:	Phase 1 Peterhead / White Rose	Phase 2 Transition Phase	Phase 3 Full Commercialisation
FEED costs	Yes	Subject to decision†	No
construction costs	Yes*		No
risk sharing during construction	Yes*		No
risk sharing during operation	Yes*		No
Feed-in-tariff Contract for Difference	Yes*	In principle, subject to decision†	In principle - all low carbon technologies compete on price†

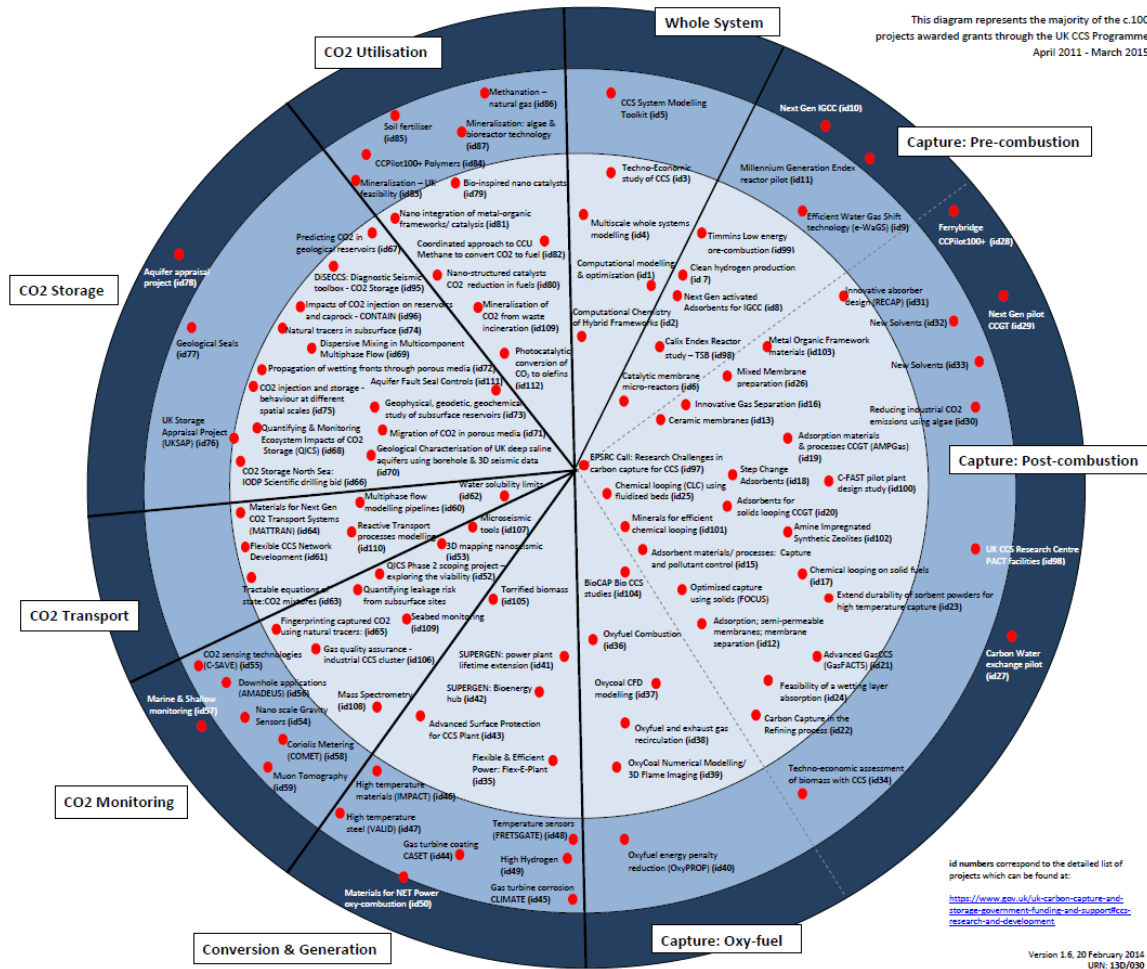
Notes:

* Subject to negotiations, Final Investment Decisions by consortia and Government, an assessment of affordability and value for money and state aid approval

† Without prejudice to future allocations from the current Levy Control Framework or future decisions on the next Levy Control Framework period



£125m R&D and innovation



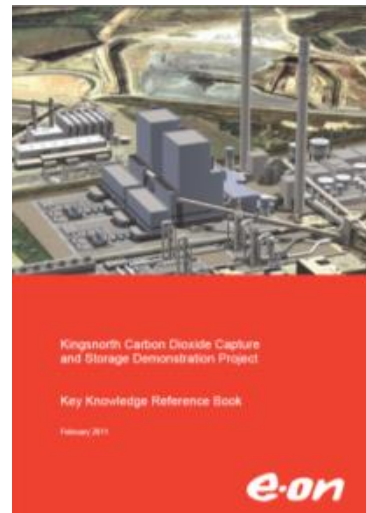
- 4 year programme (2011-2015)
- Cross-government initiative
- c100 projects
- UKCCS Research Centre



International collaboration & Knowledge Transfer

- Knowledge Transfer**

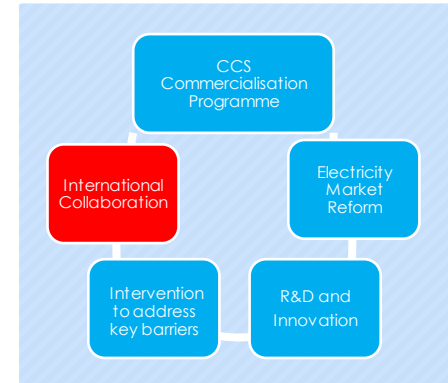
Knowledge and lessons learnt from the White Rose and Peterhead FEED studies will be shared with the wider industry to support development and cost reduction





International collaboration & Knowledge Transfer

- UK has allocated **£60m** to World Bank and the Asian Development Bank
- Supporting projects in:
 - Mexico
 - China
 - Indonesia
 - South Africa



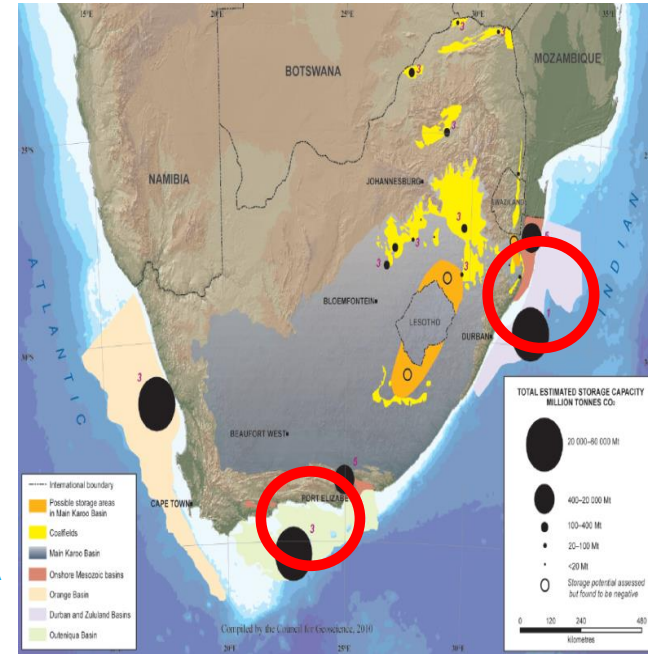
- Collaboration with international for a such as IEA GHG programme; Carbon Sequestration Leadership Forum





CCS Project – South Africa

- South Africa has developed a roadmap toward the first commercial demonstration of CCS
- Next milestone is to carry out a CO2 test storage project
- Scheduled to inject 10,000 tonnes of CO2 per year into a storage site (to start in 2017)
- Total cost of this project is estimated at \$50m, with \$25m from the World Bank CCS Trust Fund, \$20m from the SA Department of Energy and \$5m from Norway.



South Africa's CCS Roadmap





Summary

- CCS essential part of UK's future low carbon, affordable energy mix
- Substantial government support for first commercial projects
- Costs will then fall